Ecosystems and population factors

Student activity • observation and reasoning

YEAR 11 / LESSON 103 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How do living and non-living factors shape a population?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, pencil and ruler
- Labelled habitat photographs and factor cards

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Shared Biology / Double Award: 4.1 and 4.5. Ecological terms and population influences.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

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1. Define population, community, habitat and ecosystem using one local example.

2. Distinguish abiotic factors such as light, moisture and temperature from biotic factors such as competition and predation.

3. Explain how a factor can affect survival, reproduction or movement and hence abundance or distribution.

4. Draw a causal model for two interacting factors rather than assuming only one controls a population.

5. Design a field comparison with standardised sampling and record possible confounders.

6. Explain why an association in two places does not by itself establish causation.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

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Reference and task data

A population consists of members of one species in a defined area; a community includes interacting populations. An ecosystem includes organisms and their physical environment. Distribution describes where organisms occur; abundance describes how many or how much is present.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Define population.

2. Define community.

3. Give an abiotic factor.

4. Give a biotic factor.

5. How is distribution different from abundance?

6. Why might shade and plant abundance be correlated without shade being the only cause?